# Property Owner's Manual for Stormwater Management

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*Where Values Make The Difference*

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# Contents

# Section 1
# Introduction

The United States Environmental Protection Agency (EPA) has concluded that polluted stormwater runoff is a major factor in the declining quality of our nation's waters. This manual has been prepared to address stormwater quality concerns on private property, within the City of Chandler. Stormwater is runoff and surface flows generated from rainfall events. When it rains in urban areas, the stormwater runs off impervious surfaces (buildings and paved areas) instead of soaking into the ground. The stormwater collection system, also known as the storm drain system is designed to move stormwater flows along conveyances like city streets and gutters where it picks up debris and pollutants that have been previously deposited there. This polluted water is then directed into catch basins or spillways along the street and eventually deposited into retention basins, parks, washes and lakes within the community. Common pollutants found in stormwater may include, but are not limited to pesticides, fertilizers, litter, pet waste, petroleum products, automotive fluids, paints, solvents, yard waste, sediment, chemicals, metals, and materials and wastes associated with construction activities.

The stormwater collection system manages stormwater to prevent flooding and mitigate the negative effects of stormwater runoff from developed and impervious urban areas. The stormwater collection system is completely separate from the sanitary sewer system connected to our homes and businesses. The sanitary sewer system delivers wastewater from our sinks, showers, toilets, and washing machines to a wastewater treatment facility where the wastewater is treated and either reused or recharged to groundwater. Stormwater runoff collected in stormwater collection systems is not treated before it infiltrates to groundwater or is discharged to Waters of the United States and, as such, it is very important to minimize pollutants that may contaminate stormwater flows.

## 1.1 Purpose

The purpose of this manual is to provide for the health, safety and general welfare of the citizens of Chandler by establishing procedures and practices that will prevent or minimize, to the maximum extent practicable, the discharge of pollutants to City right-of-way or a stormwater collection system. Proper stormwater collection system maintenance is essential for managing runoff, providing flood control, and ensuring water quality protection. The City of Chandler Public Works Department maintains stormwater collection system components in public right-of-way, drainage easements, and on City owned property. It is the private property owner's responsibility to maintain stormwater collection system components on such private property and to minimize discharges of pollutants to the public stormwater system. The intent of this manual is to assist private stormwater collection system owners in performing proper maintenance of the system components and to inform private property owners of the requirements detailed in City of Chandler Code Chapter 45 – Storm Drainage Requirements, the City of Chandler Manual

on Stormwater Quality Protection and Technical Design Manual #3 - Storm Drainage System Design.

## 1.2 Definitions

***ADEQ*** – means Arizona Department of Environmental Quality.
***BMP's or Best Management Practices*** – means any methods, techniques, procedures or practices that may prevent or reduce the discharge of pollutants to City right-of-way or a stormwater collection system. Best management practices may include, but are not limited to; training, public outreach, recordkeeping, waste management, schedules of activities, prohibited practices, maintenance practices, good housekeeping practices, sediment and erosion control, structural practices, chemical storage, disposal practices, and any other processes that may control runoff, leaks, spills, or waste that may be discharged.
***City Right-of-Way*** – means property either owned or maintained by the City of Chandler or an easement that is intended for traffic movements, utilities, drainage and other public uses.
***Construction Activity*** – means activity that involves land development including clearing, grading, excavating, disturbing of land and any activities associated with the construction of both commercial and residential structures.
***Direct Connection*** – means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, or concentrated animal feeding operation that may connect to City right-of-way or a stormwater collection system.
***Discharge*** – means any addition of pollutants or combination of pollutants that may combine with stormwater runoff or other flows and have the potential to enter City right-of-way or a stormwater collection system.
***EPA*** – means United States Environmental Protection Agency.
***Illicit Connection*** – means any direct or indirect connection or conveyance, whether on the surface or subsurface, which, may cause or allow a non-stormwater discharge.
***Indirect Connection*** – means using, leaking, storing, spilling, dumping, allowing or disposing of pollutants, which may reasonably come into contact with stormwater or other surface flows and enter City right-of-way or a stormwater collection system.
***Non-stormwater Discharge –*** means any discharge to City right-of-way or a stormwater collection system that is not composed entirely of stormwater.
***Person*** – means any human being, any governmental or political subdivision or public agency, any public or private corporation, any partnership, any firm, association or other organization, any receiver, trustee, assignee, agent, or other legal representative of any of the foregoing or any other legal entity.
***Pollutant*** – means any solid, liquid, or gaseous substances that may have an adverse impact on human health, the environment or may alter the chemical, physical or biological properties of water or contribute to a violation of any federal, state or local water quality standard or a condition of any permit issued to the City. Pollutants include, but are not limited to solid waste, sewage, petroleum based products, pesticides, herbicides, fertilizers, sediment (dirt, sand, mud, rock, etc.), paints, solvents, household or industrial cleaners, biological materials, radioactive materials, chemical wastes,

abandoned or discarded objects, toxic wastes, pathogens, litter, incinerator residue, industrial, municipal and agricultural wastes, acids, bases, swimming pool water, pet waste, green waste, construction waste, automotive fluids or other substances that may pose an imminent and substantial danger to public health and welfare or to the environment.

***Significant Materials or Sediment –*** means any solid, liquid or gaseous substance other than stormwater that causes or may cause or contribute to the violation of a water quality standard pursuant to Article 2, Title 49, *Arizona Revised Statutes* or the provisions of any permit issued to the City of Chandler.

***Stormwater*** - means runoff, surface flows and drainage that is comprised solely of any form of precipitation.

***Stormwater Collection System*** – means all or any part of any publicly or privately owned system or structure designed or utilized to receive, collect, detain, retain, or convey stormwater and any direct connection to such system or structure. Such a system may include, but is not limited to swales, curbs, gutters, ditches, channels, parks, pipes, watercourses, drywells, culverts, storm drains, catch basins, retention or detention areas, spillways, scuppers, pump stations and common areas.

***Waters of the United States*** – means all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce. Such "waters" include, but are not limited to; navigable waters, interstate waters, wetlands, lakes, rivers, intermittent streams, and tributaries of waters identified above.

# Section 2
# Non-Stormwater Discharges

As set forth in Section 45-8, Code of the City of Chandler, and subject only to the exceptions set forth in Section 45-8.1 thereof, no person shall cause or allow a non-stormwater discharge to City right-of-way or a stormwater collection system. This prohibition includes, without limitation, non-stormwater discharges caused by illicit connections, including direct connections and indirect connections.

# Section 3
# Private Property Stormwater Management

## 3.1 General Requirements

Proper stormwater collection system maintenance is essential for managing runoff, providing flood control, and ensuring water quality protection. Private property owners shall either directly or indirectly ensure that all necessary controls are in place and properly maintained to prevent non-stormwater discharges. Such controls include but are not limited to:

- Inspecting and verifying that the proper design, construction and usage of approved materials associated with all stormwater collection systems are per approved plans;

- Conducting necessary maintenance to ensure that all components of the stormwater collection systems function properly, including maintenance and stabilization of areas prone to or subject to erosion; and
- Correcting any deficiencies that are found pursuant to either a City of Chandler or self-inspection.

## 3.2 Inspection and Maintenance Procedures

Inspections and maintenance of stormwater system components should be conducted on a regular basis to ensure the health and safety of the public. Inspection checklists should be utilized to record information such as property name, address, contact person and phone number, date, inspected by, etc. General information should include but is not limited to; the condition of system components, standing water issues, erosion issues, evidence of discharges into the system, etc.

Inspection and maintenance procedures and appropriate fiduciary mechanisms should be outlined in the association's CC&R's, and should detail who will inspect, what will be inspected, inspection frequency, recordkeeping, routine maintenance schedules, interim maintenance response procedures, and response to hazardous spills and illegal dumping procedures.

Private property owners should first determine what type(s) of stormwater collection system components are present (see Appendix A for common stormwater system components). Periodic inspections should be conducted to ensure that the system functions properly and to identify maintenance needs of system components.

Inspections of many stormwater system components may only require a visual inspection. In some cases, further investigation by a qualified contractor may be necessary to determine the cause of ponding and/or persistent standing water.
A visual inspection should include, but is not limited to;

- Identifying physical condition and structural integrity of system components
- Ability to convey stormwater
- Determination of sediment, trash, and/or debris accumulation
- Evidence of a non-stormwater discharge(s)
- Evidence of, or potential for erosion
- Presence or evidence of standing water that persists for periods greater than 36 hours.
- Existence of health and safety concerns

## 3.3 Maintenance Standards

Maintenance Standards outlined in Section 8 of the City of Chandler Storm Drainage System Design - Technical Design Manual #3 are as follows; All drainage control, flood control, and erosion control facilities, both public and private, shall be regularly

maintained. Accumulations of silt, trash, litter, or stagnant water which create a health or safety hazard or which endanger the design function of the facility are not permitted. Excessive growth or accumulation of woody vegetation in channels and on dams and levees shall not be permitted. Active erosion due to wind or water associated with drainage control, flood control, and erosion control facilities shall not be permitted.

Privately owned drainage control, flood control, and erosion control facilities shall be maintained according to the general standards above and such that adjacent upstream or downstream public or private facilities are not damaged or endangered.

## Streets

Storm water runoff is most often collected and channeled along paved streets and conveyed towards and into stormwater system components such as catch basins, scuppers, and spillways. Stormwater collects sediment, trash, debris, oil, and any other pollutant that may be deposited along paved areas. This potential polluted runoff is then discharged untreated into retention basins, parks, channels, community lakes, and even rivers. Maintaining paved areas free sediment, trash, debris, oil, etc. will assist in minimizing pollutants entering the system. The following healthy household habits can make a big difference;

- Picking up trash and debris
- Picking up pet waste
- Sweep up sediment, debris, and yard waste instead of washing driveways and sidewalks
- Properly dispose of household hazardous waste
- Use pesticides and fertilizers as directed by the manufacturer
- Cover and properly store hazardous materials to prevent spills
- Clean up spills using a dry absorbent and dispose of properly
- Park vehicles that leak fluids on private property
- Use a commercial car wash for heavily soiled vehicles
- Maintain pool drainage on private property

## Retention/Detention Basins

Retention basins are depressed areas that are often utilized as greenbelts, landscaped open areas, common areas, parks, and even community lakes. Stormwater is discharged into such basins via a variety of stormwater system components and is allowed to percolate into the soil. Retention/detention basin may require maintenance including but not limited to the following;

- Retention/detention basins may require maintenance or new installation of drywell(s) to mitigate standing water that persists for periods exceeding 36 hours
- Retention/detention basin silt removal should occur when the accumulated depth exceeds 6 inches on average in basins without sediment traps. In basins with sediment traps, silt removal should occur when accumulation exceeds 4 inches
- Detention basin surfaces which are non-vegetated shall be scarified to breakup silt deposits and surface crusting on an annual basis. Use of heavy equipment for

basin maintenance can cause excessive compaction of the basin surface and its use is discouraged for basin maintenance

- Maintain spillways and stormwater pipes to discharge into retention basins at least 6" above the bottom of the basin with a sediment trap
- Maintain by removing sediment, trash, and debris captured by trash racks at outfall points
- Ensure trash racks are installed and secured at all storm water pipe outfalls greater than or equal to 12" in diameter
- Ensure that guardrails are maintained and secured on head walls, retaining walls, etc., where a fall hazard of 30 inches or greater is present

## Drywells

A drywell is a structure that is commonly installed in retention basins and paved areas, such as streets and parking areas for the management and disposal of stormwater. Drywells allow for the settling out of sediment and debris in an upper chamber (single stage) or in a separate chamber (dual stage). Water within the settling chamber will enter an overflow pipe where it can percolate into the ground. Drywells are registered and regulated by the Arizona Department of Environmental Quality (ADEQ).

Drywells are highly susceptible to loss of effectiveness due to clogging of well screens and silt accumulation in the drainage rock. Clogging well screens can be caused by chemical encrustation of well screen materials by water soluble minerals compounded by alternating cycles of wetting and drying. Drywell efficiency can be restored by periodic jetting with water and compressed air to remove silt.

The inlet chamber of the City Standard Dual Chamber Drywell serves as a trap for heavy sediments and trash. Inlet chambers should be cleaned periodically as described below. The amount of sediment, which deposits in the inlet chamber can be significantly reduced by maintaining an adequate sediment trap around the drywell inlet.

Drywell inlet grates shall be maintained 2-inches above the bottom elevation of retention basins.

The property owner of record shall be responsible for the design, performance, operation, and maintenance of drywells used with on-site retention. Drywells that cease to drain a project area in a 36-hour period shall be replaced by the maintenance authority with new ones.

### Drywell Inspection

Drywell inspections are to be performed annually or whenever ponding is still evident 36 hours after a storm. Inspections shall be documented utilizing ADEQ's inspection checklist and kept on file by the drywell facility owner. Should inspection reveal that a drywell is no longer effective and cannot be returned to effective use, a new drywell shall be installed. Drywell maintenance shall occur when inspection shows:

- Ten percent of the drywell capacity is filled with sediment, for drywells in paved areas

- Twenty-five percent of the drywell capacity is filled with sediment for drywells in landscaped areas
- Drainage time has increased beyond 36 hours
- A non-stormwater discharge has entered the well
- Upon change of ownership of the well

**Drywell Maintenance**
Drywell maintenance may include, but is not limited to;

- Removal of sediment, trash, and debris
- Replacement of filter fabrics (if any) and petrochemical absorbent
- Cleaning/replacement of screens
- Opening of liner weep holes
- Purging of accumulated silt out of the aggregate fill by jetting, surging, or pumping
- Ensure interceptor grates and drywell access covers are properly secured within the support frame

## Catch Basins

Catch basins are storm drain inlets installed along the street curb and gutter, street shoulders, paved areas, and landscaped areas. Catch basins located in landscaped areas and paved areas without curb and gutter consist of a concrete box structure with an inlet grate covering the structure. Catch basins along curb and gutter locations consist of an inlet opening within the curb and may also have an inlet grate incorporated within the gutter. Catch basins may or may not have a depressed bottom to allow for deposition of sediment and/or debris prior to discharging runoff via a pipe to a retention/detention basin, underground retention system, drywell or bubbler box. Catch basins that are not properly maintained may cause or contribute to street flooding or standing water issues. Maintenance of catch basins may include, but are not limited to;

- Removal of sediment, trash, and debris from the catch basin and lateral sections of pipe
- Ensure that inlet grate is properly secured within support frame

## Scuppers and Spillways

Scuppers are concrete structures installed along the curb and gutter of paved areas. Stormwater enters scuppers from the street where it is conveyed beneath a sidewalk and along a sloped concrete spillway into a retention basin, landscaped area, etc. Scuppers that are not properly maintained may cause or contribute to street flooding or standing water issues. Maintenance of scuppers, spillways and transition areas may include, but are not limited to;

- Removal of sediment, trash, and debris from the scupper inlet and spillway
- Removal of sediment, trash, and debris from splash pads
- Ensure positive flow line towards the center of the retention area. Maintain transition from spillway to turf or landscaped area to promote positive drainage and prevent standing water

## Culverts and Equalizer Pipes

Culverts are concrete structures that allow for vehicle access over an open channel. Such structures are found near entrances to communities or businesses.

Equalizer pipes are linear sections of pipe that allow for drainage from one retention area to another. These pipes are subsurface with pipe openings into each retention area. Equalizer pipes may also be connected to headwalls. Maintenance of culverts and equalizer pipes may include, but are not limited to;

- Removal of sediment, trash, and debris from culverts and pipes to prevent standing water issues
- Maintain turf or landscaped areas at culvert and pipe openings to ensure positive flow towards the center of retention areas

## Headwalls

Headwalls are concrete structures that are installed at subsurface, pipe discharge points. Headwalls may be utilized at equalizer pipe openings or at outfalls leading from a catch basin from the street. Headwalls generally have guardrails attached to the top and sides or wings, Grates or trash racks are installed across the pipe openings to prevent children and animals from entering the pipe, and to catch trash and debris. Splash pads are required at outfall points and are intended to decrease the velocity of stormwater flows into turf or landscaped areas, and to trap sediment and debris. Maintenance of headwalls may include, but is not limited to;

- Removal of sediment, trash, and debris from inside pipe openings and lateral sections of pipe
- Removal of sediment, trash, and debris from trash racks and splash pads
- Removal of vegetative matter that may hinder the flow of stormwater into the retention area
- Ensure structural integrity of headwalls, guardrails, and trash racks
- Ensure positive flow line towards the center of the retention area. Maintain transition from spillway to turf or landscaped area to promote positive drainage and prevent standing water

## Bubbler Box

A bubbler box is a concrete structure that consists of a grate on the top and may or may not have an opening on the front. Bubbler boxes are found in retention areas and are generally connected via lateral pipe sections from a catch basin(s). Bubbler boxes may also be directly connected via pipe to a drywell interceptor chamber. Maintenance of bubbler boxes include, but are not limited to;

- Removal of sediment, trash, and debris from within the bubbler box and lateral sections of pipe
- Ensure that grate is properly secured within support frame

## Underground Retention Storage Structures

Underground retention structures or tanks are most commonly constructed of large corrugated metal pipe, and are generally found in commercial and industrial areas. The

subsurface tanks receive stormwater from catch basins installed within paved areas. The tanks are installed so as to drain towards and into a drywell interceptor chamber, via a subsurface pipe connection. Maintenance of underground retention structures may include, but are not limited to;

- Removal of sediment, trash, and debris from tanks
- Ensure inlet grates are properly secured within support frame

## 3.4 Best Management Practices

Best Management Practices (BMP's) are any methods, techniques, procedures or practices that may prevent or reduce the discharge of pollutants to City right-of-way, a stormwater collection system, or a Water of the United States. Best management practices may include, but are not limited to; public outreach, recordkeeping, waste management, street sweeping, maintenance schedules, prohibited practices, inspection and maintenance practices, good housekeeping practices, sediment and erosion control, chemical storage, disposal practices, and any other processes that may control runoff, leaks, spills, or waste that may be discharged.

Public outreach is necessary to educate residents or tenants on the importance of the stormwater system and to ensure that illegal dumping or licit connections to the system do not occur. Articles in community newsletters and discussions at meetings are good ways of accomplishing this.

# Section 4
# Cleanup and Reporting

## 4.1 Cleanup

As soon as any person has actual or constructive knowledge of any non-stormwater discharge from his or her property, he or she shall promptly undertake all necessary steps to discover the source and the extent of discharge, and proceed with the appropriate cleanup.

## 4.2 Notice

In addition to any other regulatory notice requirements that may apply, any person who has actual or constructive knowledge of any non-stormwater discharge from his or her property, which may result in significant materials or sediment entering into a City right-of-way, stormwater collection system or other property owned by the City, shall report such discharge as follows:

1) if an imminent and substantial danger to public health and welfare or to the environment exists, immediately contact emergency assistance (911). If assistance

is needed for the removal of hazardous waste, contact the City of Chandler Environmental Management office; and

2) for discharges of significant materials or sediment to City right-of-way, City stormwater collection systems or other property owned by the City not involving an imminent and substantial danger to public health and welfare or to the environment, contact the City of Chandler Streets Division of the Public Works Department by telephone within twenty-four (24) hours.

A follow-up written report shall be provided to the City of Chandler Environmental Management office, and to the City of Chandler Streets Division of the Public Works Department, within three (3) business days of the discharge. The written report may be submitted via mail, fax, or in person and shall identify the location, source of discharge and pollutant(s), extent of discharge, pollutant(s) discharged and all measures taken to mitigate the discharge. Additionally, if the discharge includes hazardous waste, the report shall detail the method of disposal and disposal facility receiving the waste material. The report shall also identify all practices that were implemented to prevent similar discharges in the future.

# Section 5
# Enforcement

The provisions of this manual shall be enforced in the same manner as the provisions of Chapter 45, Code of the City of Chandler, are enforced. Violation of the provisions of this manual, or the provisions of Chapter 45, Code of the City of Chandler, shall be deemed to constitute a nuisance.

# APPENDIX A

# Common Stormwater Collection System Components

## Streets

# Retention/Detention Areas

# Drywells

# Catch Basins

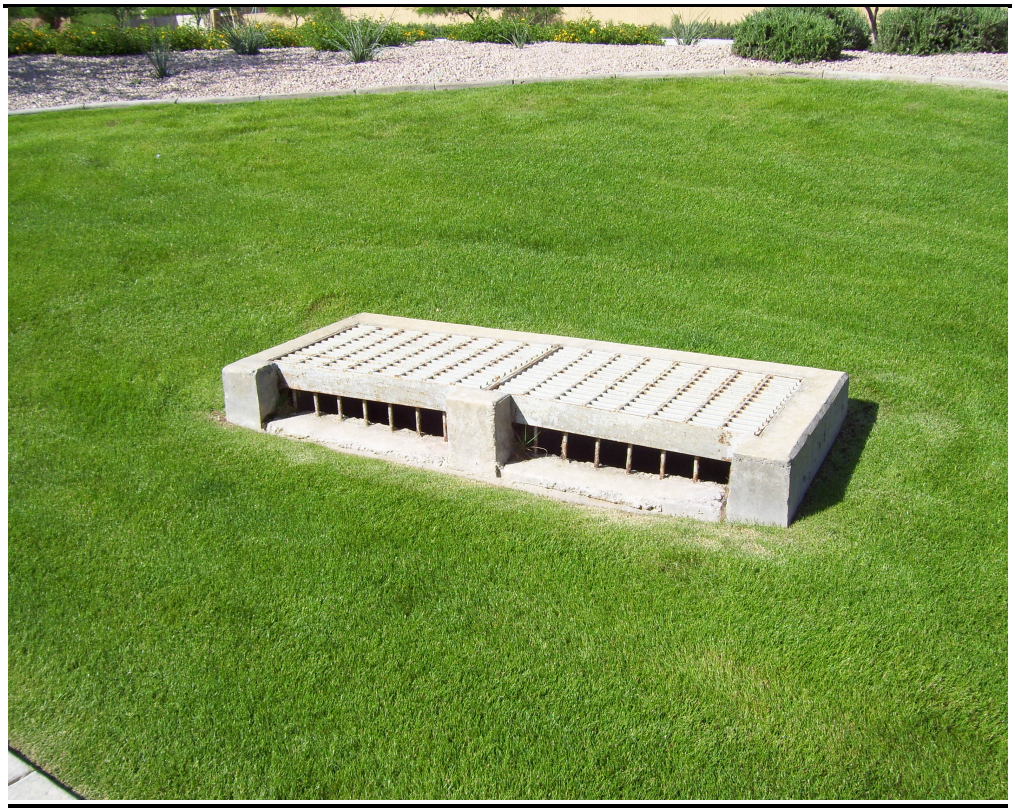
# Scuppers

# Spillways

# Culverts and Equalizer Pipes

# Headwalls

# Bubbler Box



# Underground Retention